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ABSTRACT

A study of early identification ratings gathered on six cohorts of kindergarten children (N = 14,793) over the school years 1978-79 to 1983-84 revealed substantial relationships between these ratings and students' sex, socioeconomic status, and month of birth. The relationships of early identification ratings in the area of language to these three variables were stronger than to similar ratings in the area of mathematics. The impact of sex, socioeconomic status, and month of birth were additive, with no significant interaction effects. Month of birth had the most effect on early identification ratings: specifically, two or three times the effects of sex or socioeconomic status. (RH)

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EARLY IDENTIFICATION PROCESS: SOME FACTS ABOUT SEX, MONTH OF BIRTH AND SOCIOECONOMIC STATUS AND THEIR RELATIONSHIPS TO EARLY IDENTIFICATION RATINGS AT THE KINDERGARTEN LEVEL

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Research Report 85-04

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EARLY IDENTIFICATION PROCESS: SOME FACTS ABOUT SEX, MONTH OF BIRTH AND SOCIOECONOMIC STATUS AND THEIR RELATIONSHIPS TO EARLY IDENTIFICATION RATINGS AT THE KINDERGARTEN LEVEL

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Beginning in the academic year 1978-79, Kindergarten teachers have made simple ratings[1] of the probable end-of-year success of their students in meeting the minimum core requirements of the language and mathematics programs. These early identification ratings (EID) were keyed into computer files along with other limited demographic data about each student. Since there have been approximately 2500 new students entering kindergarten during each of the past six years, data were available for approximately 15,000 students. However, since a single EID rating for language and mathematics combined was made during the first year, data relating to separate EID ratings were available for only five years and approximately 12,500 students.

Since we have, in prior studies, noted relationships among sex, month of birth and EID ratings, it was thought advisable to study them more thoroughly using the larger sample of students. We have, in addition, added a crude measure of socioeconomic status (SES) to each student's file.

METHOD

Sample of students

All 14,793 students who were enroled in kindergarten for the first time in each of the six school years from 1978-79 to 1983-84 were included in this study. Since the 2572 students in the 1978-79 school year were given a single, combined EID rating for both language and mathematics, they were excluded from some of the analyses. In addition, the approximately one percent of students who received an EID rating of zero were omitted from some of the analyses.

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[1] EID ratings, made by classroom teachers and school teams separately for language/reading and mathematics, consist of a simple scale, as follows:

0 = insufficient contact with student to make a judgment
1 = student will be ready, by the end of the school year, for the work of the next school year
2 = student *may not be ready*, by the end of the school year, for the work of the next school year
3 = it is *quite certain* that the student *will not be ready*, by the end of the school year, for the work of the next school year.

During the initial year of the EID system, a single combined rating for both language and mathematics was used.

Variables available for study

For each student the following variables were available for study: sex, year of birth, month of birth (MOB), school location and EID ratings in language and mathematics.

A very crude measure of socioeconomic status (SES) was developed for each student in the following manner. Using data from the 1981 census, the mean family income for persons living in each elementary school receiving district was calculated.[2] The schools were then rank ordered in terms of the magnitude of mean family income, from least to greatest. The schools were then divided into four, approximately equal groups, coded 1 to 4. All students in schools coded 1 (lowest mean family income) were then simply given an SES code of 1. The same procedure was followed for the other three groups of schools, so that any student could have an SES code from 1 (lowest) to 4 (highest). Students enroled in schools coded 1 lived in districts in which the mean family income varied from $16729 to $21825. In schools coded 4, the comparable figures are $33622 to $53460. The reader should note that this SES measure is an extremely crude one, especially since it assigns every student in any particular school the same SES code.

Analyses

The primary analyses consisted of calculating frequency and percentage frequency distributions and descriptive statistics for all variables for all students and for various subsets of the sample. Analyses of variance (ANOVA) were used to estimate the effects on EID ratings of sex, month of birth and SES. All analyses were done by computer using the standard programs contained in SPSSX.

RESULTS

Sex distribution

Of the 14,793 students in the study, 51.9% were male, 48.1% were female. These figures come fairly close to those for live births in 1982 in all of Ontario (51.4% male and 48.6% female) and in all of Canada (51.3% male and 48.7% female).

Distribution by month of birth

Table 1 gives the percent of children, in the study sample and all children born in Ontario during 1982, born during each month of the year. About 48.9% of the study sample and 49.4% of the 1982 Ontario cohort were born in the first six months of the year. In interpreting the figures presented in Table 1 one should take into account that there are not the same number of days in each month. For example, the first six months of the year contain 49.6% of all days in the year. The percentage of all days during the year contained in each month are provided in Table 1 for reference purposes.

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[2] This was done by superimposing a clear plastic map of census tracts over a map of the city on which school receiving districts were drawn and then estimating how much of each school receiving district was contained in each census tract. Mean family income was then calculated by a simple pro-rating procedure.

Effects of Sex, MOB and SES on EID ratings

In order to assess the effects of Sex, MOB and SES on the EID ratings two multivariate ANOVA tests were done with SEX, MOB and SES as classification variables and the Language and Mathematics EID ratings, in turn, treated as the dependent variable. Only those 12,221 students from the five academic years 1979-80 to 1983-84 who had non-zero EID ratings were included in these analyses.

The results of the ANOVA tests indicated that sex, MOB and SES are all significantly related to EID ratings in both language and mathematics. There was a slight indication of an interaction effect of sex and MOB but it did not reach statistical significance. The effects, therefore, of sex, MOB and SES appear to be both independent and simply additive.

The nature and size of the effects can be seen in Figures 1 and 2 which show, for mathematics and language respectively, the percentage of students receiving EID ratings of 2 or 3 by sex and SES...separately for the months of January and December. It is apparent from these figures that, overall, the relationships between sex, SES and MOB and EID ratings are more pronounced for language than for mathematics. In addition, the effect of MOB seems stronger than the effects of sex and SES.

Table 2 gives the mean EID ratings for mathematics and language for the least and most favoured groups of students for all possible combinations of sex, SES and MOB. For example, in comparing the effects of sex and MOB on EID mathematics ratings one would compare boys born in December with girls born in January. In this case, the corresponding mean EID mathematics ratings are 1.42 and 1.09. By examining the differences in the mean EID ratings between least and most favoured groups provided in Table 2, it can be observed that, in general: (1) the effects are more pronounced for language than mathematics (2) MOB seems to produce about 2 to 3 times as much effect as Sex or SES (3) the effects of sex and SES are similar and (4) the joint effect of two or more variables appears to be simply additive. For example, the effect on mathematics EID ratings for sex, SES and MOB taken together (.45) is about the same as their separate effects added together (.08 + .10 + .24 = .42).

One can obtain some sense of the magnitude of the overall effects of sex, SES and MOB by comparing the percentages of students receiving EID ratings of 2 or 3 in the most and least favoured groups, viz., girls of high SES born in January vs. boys of low SES born in December. The respective percentages for language are 5 and 51 and, for mathematics, 5 and 37. (See Figures 1 and 2.)

DISCUSSION

The consistent differences between EID ratings for boys and girls probably reflect the well-documented difference in rate of development between the sexes, especially in the area of language. Assuming that there is no difference among children in rate of intellectual growth (IQ) related to month of birth, the differences in EID ratings that are apparent as a function of month of birth probably reflect a simple difference in absolute amount of intellectual growth (mental age). That is, children born in December are

simply younger in chronological age and, on average, in mental age than children born earlier in the year. The relationship of socioeconomic status to EID ratings is probably explained in part by the fact that, in general, students from higher SES groups generally do better on tests of academic aptitude which, in turn, is associated with better performance in the language and mathematics areas.

SUMMARY

A study of early identification ratings gathered on six cohorts of kindergarten children (N = 14,793) over the school years 1978-79 to 1983-84 revealed substantial relationships between these ratings and students' sex, socioeconomic status and month of birth. The relationships of early identification ratings in the area of language to these variables were stronger than to similar ratings in the area of mathematics. The impact of sex, socioeconomic status and month of birth are simply additive, with no significant interaction effects. Month of birth has the most effect on early identification ratings...two to three times the effects of sex or socioeconomic status.

Table 1 Percent of students born during each month of the year for study sample and Ontario

Population	Month of Birth											
	1	2	3	4	5	6	7	8	9	10	11	12
Study sample	7.1	7.7	9.0	8.4	8.3	8.4	8.9	8.5	8.5	8.8	8.1	8.3
Ontario, 1982	7.6	7.5	8.5	8.5	8.7	8.6	8.8	8.6	8.6	8.3	8.0	8.3
Percent days of the year	8.5	7.7	8.5	8.2	8.5	8.2	8.5	8.5	8.2	8.5	8.2	8.5

Table 2 Mean EID ratings for Mathematics and Language for Least and Most favoured groups of students for all possible combinations of Sex, Socioeconomic status (SES) and Month of Birth (MOB)

	Mathematics			Language		
	Least Favoured	Most Favoured	Difference	Least Favoured	Most Favoured	Difference
Sex	1.25	1.17	.08	1.34	1.22	.12
SES	1.27	1.17	.10	1.35	1.23	.12
MOB	1.35	1.11	.24	1.49	1.17	.32
Sex, SES	1.32	1.14	.18	1.41	1.17	.24
Sex, MOB	1.42	1.09	.33	1.58	1.13	.45
SES, MOB	1.42	1.09	.33	1.55	1.11	.44
Sex, SES, MOB	1.50	1.05	.45	1.68	1.05	.63

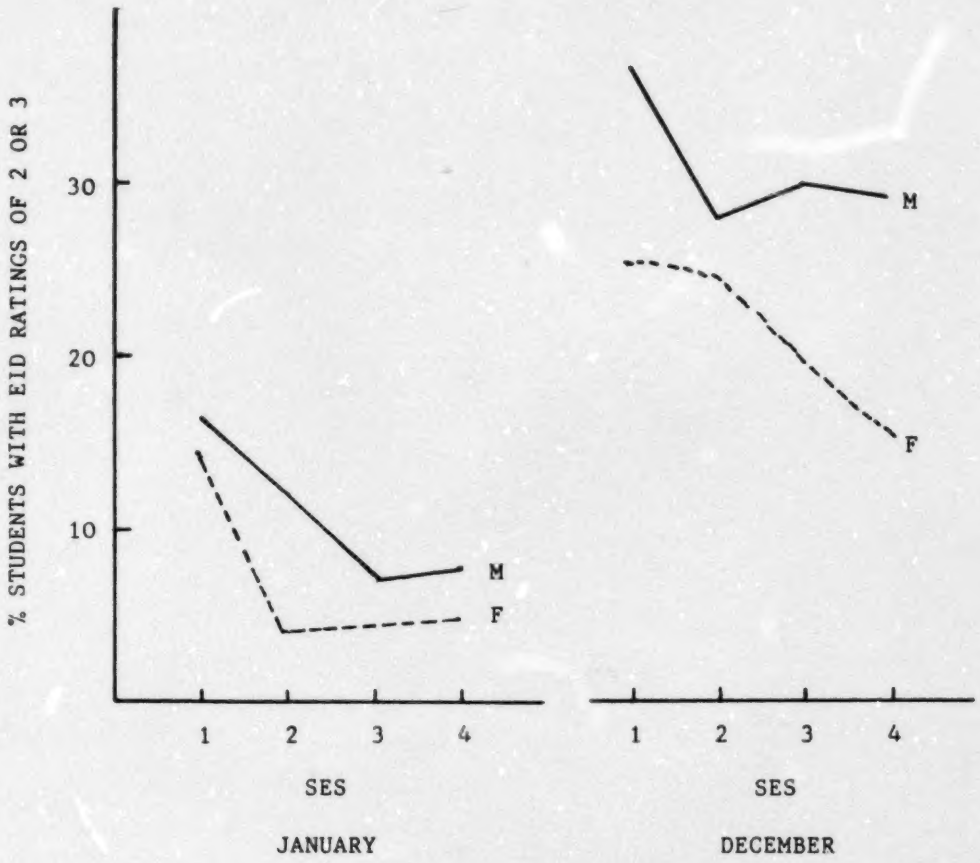

Figure 1 Percentage of students receiving EID ratings of 2 or 3 in mathematics by sex and SES for January and December

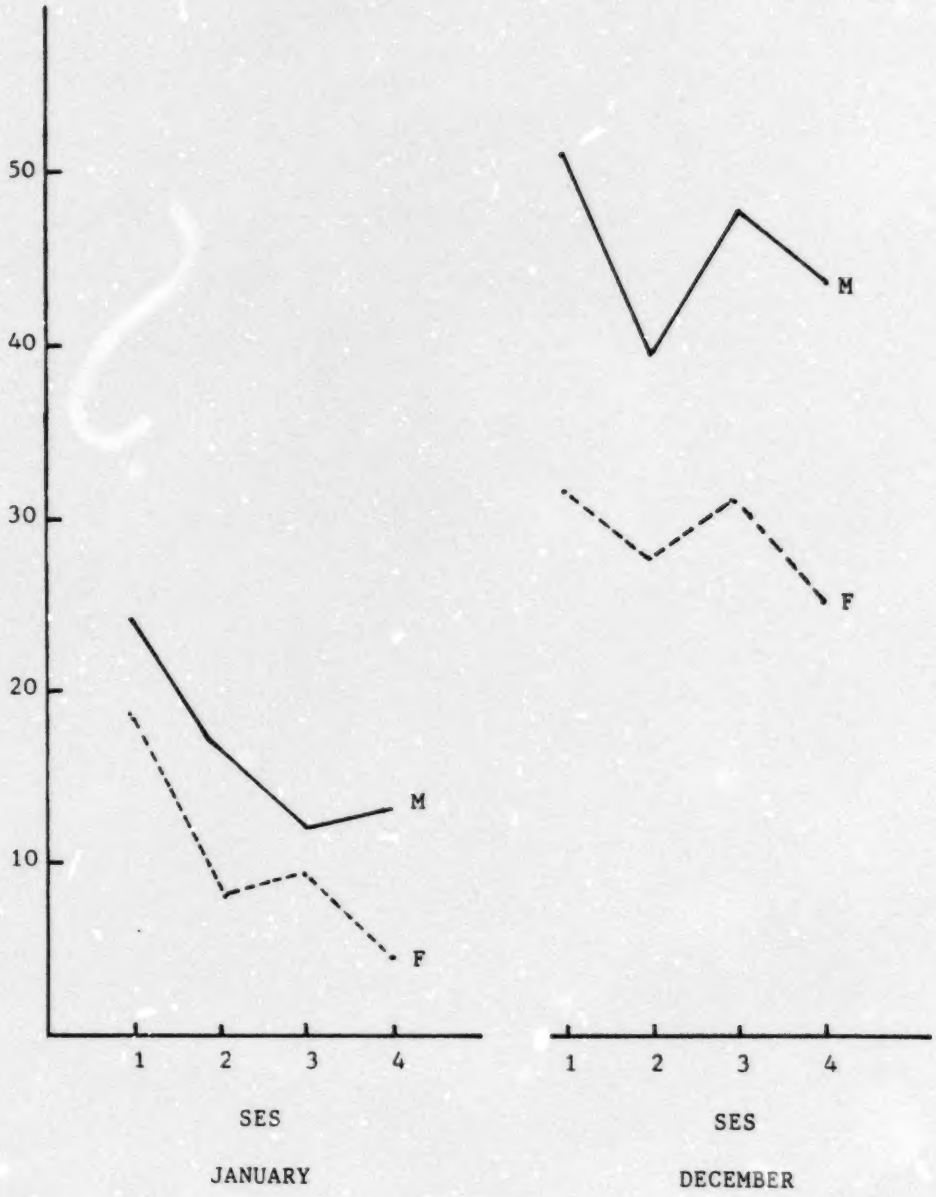

Figure 2 Percentage of students receiving EID ratings of 2 or 3 in Language by sex and SES for January and December